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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,637	10/24/2003	Satoshi Tokuda	SUT-0229	7634

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EXAMINER	
BAKER, DAVID S	

ART UNIT	PAPER NUMBER
2884	

DATE MAILED: 12/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/691,637	TOKUDA ET AL.	
	Examiner	Art Unit	
	David S. Baker	2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/24/03*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10/24/03* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/24/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 10-18 recite the limitation "said conversion layer" in the fourth line of the claims. There is insufficient antecedent basis for this limitation in the claim. Additionally, the claim language "a switching matrix substrate including switching devices arranged in array for reading out charges of said plurality of charge accumulation capacitors and driving and reading circuits" is confusing. The claim does not specify whether the switching matrix reads the charges of the capacitors, driving circuits, and reading circuits or if the switching matrix reads the charges of the capacitors while driving and reading circuits are include in the switching matrix.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 3, 6, 7, and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. The term "closely" in claims 3 and 9 is a relative term which renders the claim indefinite. The term "closely" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Due to the indefinite nature of the term, it is impossible to determine the distance or orientation to which the substrate and source are opposed to each other.

5. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claims 6, 7, and 9 recite the broad recitation "noble gases", and the claim also recites "(He, Ne, Ar)" which is the narrower statement of the range/limitation.

6. The listing of a series of related and unrelated limitations in the alternative in claim 9 renders the claim vague and indefinite. Additionally, the claim recites the terms "said source" and "said heat treatment" in paragraphs 5 and 8 (respectively) of the claim. The antecedent basis for these limitations in the claim is unclear. See MPEP § 2171, 2173.05(e), and 2173.05(h).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schiebel (US Patent #5,396,072 A) in view of McCandless (US Patent #6,251,701 B1).

Regarding claims 1-3 and 10-12, Schiebel discloses (figures 3a and 3b, column 1 lines 1-60, column 5 lines 6-68, column 6 lines 1-65) a radiation detector provided in a substrate with a detection layer (32) which is sensitive to radiation that comprises a plurality of charge accumulation capacitors (2) for accumulating charges from a detection layer (32), a switching matrix including switching devices (1) arranged in array for reading out charges of the plurality of charge accumulation capacitors (2), driving (9) and reading circuits (18), a substrate for the radiation detector and the matrix switching layer,

and a detection layer comprising CdTe that is doped with Cl. Schiebel does not disclose expressly wherein the detector is formed by vapor deposition or sublimation while using as a source a mixture of CdTe (cadmium telluride), ZnTe (zinc telluride) and CdZnTe (cadmium zinc telluride) and a second material including at least one of $CdCl_2$ (cadmium chloride) or $ZnCl_2$ (zinc chloride), or wherein the detection layer is formed in the condition that the substrate and the source are closely opposed to each other. McCandless discloses (figure 2, column 3 lines 45-67, column 4 lines 1-15 and 46-54) a vapor phase deposition method of fabricating polycrystal CdTe thin films while using $CdCl_2$ as a secondary material where the substrate (110) and the source (122) are closely opposed to each other. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the method in McCandless to create the sensor panel of Conrads that contains the materials outlined in Schiebel. The suggestion/motivation for doing so would have been that the vapor deposition process of forming a CdTe:Cl polycrystal microfilm shown by McCandless can produce the radiation detector outlined above without the usual large amounts of liquid reactant and etching materials thereby cutting down the costs and waste of the production process.

Regarding claims 4-7 and 13-16 Schiebel discloses (figures 3a and 3b, column 1 lines 1-60, column 5 lines 6-68, column 6 lines 1-65) a radiation detector with a detection layer (32) which is sensitive to radiation that comprises a plurality of charge accumulation capacitors (2) for accumulating charges from a detection layer (32), a switching matrix including switching devices (1) arranged in array for reading out charges of the plurality of charge accumulation capacitors (2), driving (9) and reading

circuits (18), a substrate for the radiation detector and the matrix switching layer, and a detection layer comprising CdTe that is doped with Cl. Schiebel does not disclose expressly doping CdTe with Cl by heating while supplying the detection layer with vapor containing Cl atoms, wherein the detector is doped with Cl by conducting heat treatment in the condition that powder containing at least one of $CdCl_2$ (cadmium chloride) or $ZnCl_2$ (zinc chloride) or its sintered body is opposed, wherein atmosphere of said heat treatment contains at least one of N_2, O_2, H_2 and noble gases kept at 1 atmospheric pressure, or wherein atmosphere of said heat treatment contains at least one of N_2, O_2, H_2 and noble gases kept at $1.3x10^{-4}$ to 0.5 atmospheric pressure. McCandless discloses (figure 2, column 3 lines 45-67, column 4 lines 1-15 and 46-54) doping CdTe with Cl by heating while supplying the detection layer with vapor containing Cl atoms, wherein the detector is doped with Cl by conducting heat treatment in the condition that powder containing $CdCl_2$ is opposed to the detection layer in an H2 environment kept at $1.3x10^{-3}$ to 1 atmospheric pressure. The suggestion/motivation for doing so would have been that the vapor deposition process of forming a CdTe:Cl polycrystal microfilm shown by McCandless can produce the radiation detector outlined above without the usual large amounts of liquid reactant and etching materials thereby cutting down the costs and waste of the production process.

Regarding claims 8 and 17, Schiebel discloses (figures 3a and 3b, column 1 lines 1-60, column 5 lines 6-68, column 6 lines 1-65) a radiation detector with a detection layer (32) which is sensitive to radiation that comprises a plurality of charge accumulation capacitors (2) for accumulating charges from a detection layer (32), a switching matrix

including switching devices (1) arranged in array for reading out charges of the plurality of charge accumulation capacitors (2), driving (9) and reading circuits (18), a substrate for the radiation detector and the matrix switching layer, and a detection layer comprising CdTe that is doped with Cl.. Schiebel does not disclose expressly doping CdTe with Cl by heating while supplying the detection layer with vapor containing Cl atoms. McCandless discloses (figure 2, column 3 lines 45-67, column 4 lines 1-15 and 46-54) doping a polycrystal thin film of CdTe with Cl by heating while supplying the detection layer with vapor containing Cl atoms. The suggestion/motivation for doing so would have been that the vapor deposition process of forming a CdTe:Cl polycrystal microfilm shown by McCandless can produce the radiation detector outlined above without the usual large amounts of liquid reactant and etching materials thereby cutting down the costs and waste of the production process.

Regarding claims 9 and 18, Schiebel discloses (figures 3a and 3b, column 1 lines 1-60, column 5 lines 6-68, column 6 lines 1-65) a radiation detector provided in a substrate with a detection layer (32) which is sensitive to radiation that comprises a plurality of charge accumulation capacitors (2) for accumulating charges from a detection layer (32), a switching matrix including switching devices (1) arranged in array for reading out charges of the plurality of charge accumulation capacitors (2), driving (9) and reading circuits (18), a substrate for the radiation detector and the matrix switching layer, and a detection layer comprising CdTe that is doped with Cl. Schiebel does not disclose expressly that the CdTe:Cl detection layer is a polycrystal. McCandless discloses (column 3 lines 50-55) a CdTe polycrystal creation method. At the time the invention

was made, it would have been obvious to a person of ordinary skill in the art to use a polycrystal form of CdTe to create the radiation detector. The suggestion/motivation for doing so would have been that by using the polycrystal form of CdTe, a higher data resolution could be obtained because the grain boundaries of the CdTe layer would be better protected therefore resulting in a smaller leak current.

Regarding claims 19 and 20, Schiebel discloses (figures 3a and 3b, column 1 lines 1-60, column 5 lines 6-68, column 6 lines 1-65) a radiation detector with a detection layer (32) which is sensitive to radiation that comprises a plurality of charge accumulation capacitors (2) for accumulating charges from a detection layer (32), a switching matrix including switching devices (1) arranged in array for reading out charges of the plurality of charge accumulation capacitors (2), driving (9) and reading circuits (18), a substrate for the radiation detector and the matrix switching layer, and a detection layer comprising CdTe that is doped with Cl. Schiebel does not disclose expressly wherein the detector is formed by vapor deposition or sublimation while using as a source a mixture of CdTe (cadmium telluride), ZnTe (zinc telluride) and CdZnTe (cadmium zinc telluride) and a second material including at least one of $CdCl_2$ (cadmium chloride) or $ZnCl_2$ (zinc chloride), or wherein the detection layer is formed in the condition that the substrate and the source are closely opposed to each other. McCandless discloses (figure 2, column 3 lines 45-67, column 4 lines 1-15 and 46-54) a vapor phase deposition method of fabricating polycrystal CdTe thin films while using $CdCl_2$ as a secondary material where the substrate (110) and the source (122) are closely opposed to each other. At the time the invention was made, it would have been obvious to a person of ordinary skill in the

art to use the method in McCandless to create the sensor panel of Schiebel. The suggestion/motivation for doing so would have been that the vapor deposition process of forming a CdTe:Cl polycrystal microfilm shown by McCandless can produce the radiation detector outlined above without the usual large amounts of liquid reactant and etching materials thereby cutting down the costs and waste of the production process.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Baker whose telephone number is 571-272-6003. The examiner can normally be reached on MTWRF 10:00am-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David S Baker
Examiner
Art Unit 2884

DSB

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